CLAIMS

1. A flow through gas separator assembly, associated with a source of fluid, comprising:

   A) an inlet end, disposed to receive fluid from the fluid source;

   B) a conduit component coupled with said inlet end, for conveying the fluid, said conduit component having walls comprised substantially of a porous, hydrophobic material, that defines a tortuous path therethrough; and

   C) and outlet end coupled with said conduit, said outlet end including an end cap member having a flow limiting orifice that generates backpressure within fluid traveling in said conduit in such a manner that said fluid is pushed along said hydrophobic walls and into said tortuous path whereby gases contained within said fluid are separated out and released from said fluid.

2. The gas separator assembly as defined in claim 1 wherein said end cap of said outlet end is comprised substantially of a hydrophilic material.

3. The gas separator assembly as defined in claim 2 further comprising a duct coupled to said conduit on an outer side of said walls of said conduit to capture said gas that is separated from said fluid.

4. A gas separator assembly for use with a direct oxidation fuel cell that includes a membrane electrode assembly having a protonically-conductive membrane electrolyte, with a catalyst disposed thereupon, said membrane having an anode face and a cathode face, and an anode chamber being defined within said cell contiguous to said anode and a cathode chamber being defined within said cell contiguous to said cathode, and when a fuel is introduced into the anode chamber, electricity-generating reactions occur in which anodically generated carbon dioxide, electrons and protons are produced and when supplied with oxygen, cathodically-generated water is produced, the gas separator assembly, comprising:

A) an inlet end coupled with said anode chamber to receive anode effluent including unreacted fuel and water and carbon dioxide;

B) a conduit component coupled with said inlet end in to which said anode effluent is conveyed, said conduit having walls comprised substantially of a porous, hydrophobic material, and defining a tortuous path exiting said conduit; and

C) an outlet end having a cap member disposed within the outlet end and said cap member having a flow limiting orifice to generate backpressure within fluid in said conduit component, whereby anode effluent under backpressure is pressed against the walls of said conduit and thereby into said tortuous path, to separate out carbon dioxide gas from said anode effluent.

5. The gas separator assembly as defined in claim 4 wherein end cap of said outlet end is comprised substantially of a hydrophilic material.

6. The gas separator assembly as defined in claim 4 further comprising capture duct coupled with said conduit component for receiving said carbon dioxide separated from said anode effluent.

7. The gas separator assembly as defined in claim 4 wherein said conduit component is U-shaped.

8. The gas separator assembly as defined in claim 4 wherein said conduit component has a bend in it such that it is formed to be coupled with said anode chamber.

9. The gas separator assembly as defined in claim 4 wherein said conduit component is coiled.

10. The gas separator assembly as defined in claim 4 wherein said outlet end is tapered to form a cone-like shape.

11. The gas separator assembly as defined in claim 5 further comprising a T-junction fitting coupled to said conduit component to capture said carbon dioxide separated from said anode effluent.

12. The gas separator assembly as defined in claim 4 further comprising

a plurality of said conduit components placed in series along an associated outer duct, said outer duct having openings therein for release and capture of said carbon dioxide.

13. The gas separator assembly as defined in claim 5 further comprising a catalyst-coated screen for oxidizing any methanol vapor that is separated out of said anode effluent with said carbon dioxide.

14. The gas separator assembly as defined in claim 4 wherein said fuel cell is of a planar design.

15. The gas separator assembly as defined in claim 4 wherein said fuel cell is of a stacked design.

16. A gas separation apparatus for use with a direct oxidation fuel cell that includes a membrane electrode assembly having a protonically-conductive membrane electrolyte, with a catalyst disposed thereupon, said membrane having an anode face and a cathode face, and an anode chamber being defined within said cell contiguous to said anode and a cathode chamber being defined within said cell contiguous to said cathode, and when a fuel is introduced into the anode chamber, electricity-generating reactions occur in which anodically generated carbon dioxide, electrons and protons are produced and when supplied with oxygen, cathodically-generated water is produced, the gas separator assembly, comprising:

(A) means for introducing anodic effluent from the anode chamber of the fuel cell;

(B) means for conveying anodic effluent from said anode chamber along a hydrophobic, tortuous path;

(C) means for limiting flow out of said conveying means to create backpressure within said conveying means whereby carbon dioxide is separated out from said anode effluent as said anode effluent is conveyed along said hydrophobic tortuous path.

17. The gas separation assembly as defined in claim 16 wherein said means for conveying is a conduit shaped to conform to an associated fuel cell housing.

18. The gas separation assembly as defined in claim 16 further comprising means for capturing carbon dioxide separated from said anode effluent.

19. The gas separation assembly as defined in claim 16 wherein said means for capturing said carbon dioxide includes a T-junction.

20. The gas separation assembly as defined in claim 16 wherein said means for capturing said carbon dioxide includes a tube-in-tube assembly.

21. A method of separating carbon dioxide from an anode effluent produced in a direct oxidation fuel cell that includes a membrane electrode assembly having a protonically-conductive membrane electrolyte, with a catalyst disposed thereupon, said membrane having an anode face and a cathode face, and an anode chamber being defined within said cell contiguous to said anode and a cathode chamber being defined within said cell contiguous to said cathode, and when a fuel is introduced into the anode chamber, electricity-generating reactions occur in which anodically generated carbon dioxide, electrons and protons are produced and when supplied with oxygen, cathodically-generated water is produced, the gas separator assembly, the method including the steps of:

(A) introducing anodic effluent from the anode chamber of the fuel cell;

(B) conveying anodic effluent from said anode chamber along a hydrophobic, tortuous path;

(C) limiting flow out of said conveying means to create backpressure within said conveying means whereby carbon dioxide is separated out from said anode effluent as said anode effluent is conveyed along said hydrophobic tortuous path.